SCHOOL BUS BRAKING SYSTEM

Brake Systems: General

The brake system shall comply with federal specifications applicable for the specific year of the vehicle. (MCLA 257.1810)

RED: Vehicle does not comply with federal specifications.

Defective Brakes: A defective brake includes any brake that meets one of the following criteria:

- Absence of effective braking action upon application of the service brakes such as brake linings, failing to move or contact braking surface upon application. RED: Brake fails to operate upon application.
- Missing or broken mechanical components.
- Loose brake components including air chambers, spiders, camshaft support brackets and calipers.

YELLOW: Required components improperly mounted.
RED: A part of parts are defective or worn beyond specifications.
RED: Required braking components missing.

Hydraulic System

Hydraulic hoses and tubes.
RED: Hoses or tubing are leaking, flattened, restricted, or distorted. Chafed to cord or cracked exposing cords.

Wheel cylinders.

RED: Wheel cylinder leaks.

Master cylinders and gasket.

YELLOW: Master cylinder gasket is torn or misshapen.

Reservoirs.

YELLOW: Level in either reservoir is more than ½ empty.
RED: Level in either reservoir is more than ¾ empty.

Condition of Linings and Pads (All measurements must be done with steel tape or ruler).

- Bonded Linings
  RED: Thinnest point is less than 1/16 inch.
- Riveted Linings
  RED: Thinnest point is less than 1/16 inch.
- All Linings
  YELLOW: Lining is broken/cracked.
  RED: Friction surface is contaminated with oil or grease. (Grease on top of shoe is not cause for rejection).
  RED: Lining is not firmly attached to shoe.

Pads (Disc Brakes)

RED: Any pad is 3/16 inch or less on vehicles with GVWR more than 10,000 lbs.
RED: Any pad is 1/16 inch or less on vehicles with GVWR of less than 10,000 lbs.
RED: Any pad not firmly attached to shoe.

Dual Hydraulic Circuits

Brake warning light.
RED: Light fails to come on when ignition is in start position.
RED: Light comes on when brake pedal depressed and engine is running.

Test Procedures for Hydraulic Brakes with Electric Boost

Key off, depress brake pedal, motor should run.
RED: Electric boost fails to run.
Key on, engine off, light, buzzer and pump should come on.
RED: Light or buzzer fails to operate.
Key on, engine off, depress brake pedal, pump should run.
RED: Pump fails to run.
Prior to April 22, 1985, the key had to be in the "on" position and the brake pedal depressed to activate the boost assist motor.

Hydraulic System with Hydraulic Pump Assist

Apply pressure with key off and on.

RED: Brake electric assist motor does not operate.
Apply pressure with engine started.
RED: Brake pedal does not drop slightly with pressure applied.
RED: Brake warning lamp stay on when engine is running.
Fluid reservoir and belts.
YELLOW: Fluid level in pump reservoir is low or belt is badly worn.
YELLOW: Fluid leaks.
RED: Any visible and constantly dripping leak with service brakes applied at any point in the system.

Hydraulic System with Vacuum Assist

With engine off and no vacuum in system, depress brake pedal with 25 pounds of force. While maintaining that force, start the engine. Pedal should fall slightly.
RED: Brake pedal does not fall slightly under force when the engine starts.

Vacuum Reserve

Build full vacuum, shut engine off and make as many full brake applications as possible.
RED: Vacuum reserve is insufficient to make three full applications after engine is shut off.

Low Vacuum Indicators

On vehicles with low vacuum indicators, build full vacuum, shut off engine and reduce vacuum by making a series of moderate brake applications. A flasher or buzzer signal should function when vacuum reaches 8 inches Hg on gauge.
RED: Indicator fails to function when system is reduced to 8 inches HG vacuum.

Check Valve

A check valve to prevent loss of stored vacuum shall safeguard system.
RED: Check valve is inoperative or missing.

Brake Drums on Air and Hydraulic Systems

Drum friction surface.
YELLOW: Substantial cracks on the friction surface extending to open edge. (Short hairline heat check cracks should not be considered.)

- Inspect for cracks on the outside of the drum.
  RED: There are external cracks.
- Inspect for contaminated friction surface.
  RED: Friction surface is contaminated with oil, grease or brake fluid.
- Measure inside diameter of drum using a drum micrometer.
  RED: Inside diameter of drum is greater than diameter stamped on drum.

Disc Brake Systems

Rotor friction surface and rotor heat fins.
RED: Rotor friction surface and/or heat fins with cracks to open edge.
Measure thickness of rotor using an OD Micrometer.
RED: Exceeds manufacturer specifications or as marked on rotor.
Caliper and anchor plate sliding surfaces.
YELLOW: Caliper froze on slides.
RED: Piston froze in bore.
RED: Caliper anchor plate is welded or brazed. More than one shim per caliper.
Mechanical components. (Drums, linings, cables, return springs, and anchor pins.)
RED: There is oil or grease on the drum or lining. The lining is worn through to the steel band or rivets.
RED: Mechanical parts are missing, broken or badly worn.

Parking Brake

Apply parking brake with engine running at idle. Slightly accelerate with vehicle in either drive or second gear.
RED: Parking brake fails to hold.
RED: Parking brake does not apply or release completely.

Airlines: Hoses, Tubing and Connections

YELLOW: Lines and hoses chafed by moving parts and those contacting exhaust system except on diesel fueled buses.
RED: Lines and hoses that are leaking, broken, crimped, cracked, bulged under pressure or severely chafed (with exposed cords).

RED: Airlines contacting exhaust components on other than diesel operated buses.

Valves: Check, High Pressure Relief, Inversion

RED: If valves are inoperative.

RED: Fails to function properly

RED: Air tanks manufactured with high-pressure relief valves are not maintained as manufactured.

Compressor

Proper build up time. (50-90 psi within 3 minutes at fast idle; 1500 rpm for gas and 1100 rpm for diesel engines.)

RED: Build up time is more than 3 minutes.

Proper governor cut in and cut out times (minimum 80 psi; maximum 135 psi.)

RED: Cut in pressure is less than 80 psi or cut out pressure is greater than 135 psi.

Proper mounting and belt condition.

YELLOW: Belts that are frayed, cracked or loose. Loose mounting.

Air Component Height

Air reservoirs and components.

YELLOW: Reservoirs or components are less than 15 inches from the road surface.

Moisture Ejectors/Air Dryers

RED: Inoperative or missing.

Low Air Warning Device

YELLOW: Buses equipped with two devices (light and buzzer) and one is out.

RED: Low air warning device is inoperable.

RED: System does not activate at ½ cut out pressure or 60 psi, which ever is less.

Brake Chamber Size, Push Rod Stroke, and Slack Adjuster Length

Size chambers.

RED: Air chamber size is mismatched on same axle.

Push rod stroke.

YELLOW: Retraced push rod lengths differ more than ½" on same axle other than steering axle.

RED: Push rod stroke is mismatched by 1/2" or more on steering axle.

RED: Push rod stroke exceeds adjustment limits. See chart.

Slack adjuster length.

RED: Vehicles manufactured after 10/20/94 that are not equipped with automatic slack adjusters.

RED: Slack adjuster length is mismatched on steering axle.

Air Leaks

With system fully charged, stop engine and record pressure drop (psi/min) with brakes fully applied.

RED: Air leak(s) that exceed(s) 3 psi/min.

RED: An audible air leak at the brake chamber or any other location (besides a proper fitting).

With system fully charged, stop engine and record pressure drop (psi/min) with brakes fully released.

RED: Air leak(s) that exceed(s) 2 psi/min.

RED: An audible air leak at the brake chamber or any other location (besides a proper fitting).

Pre FMVSS 121 Vehicles: Parking/Emergency Brakes

Fully apply the parking/emergency brake. Deplete the service reservoir air and make several applications with the parking/emergency brake.

YELLOW: Brakes do not release simultaneously.

RED: Brakes fail to hold when applied.

RED: Spring brakes fail to apply or release fully when control valve is operated.

RED: Reserve air is insufficient to allow for at least 3 brake applications.